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## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 12 May 2000 (12.05.00)	
International application No. PCT/FI99/00724	Applicant's or agent's file reference 48668
International filing date (day/month/year) 07 September 1999 (07.09.99)	Priority date (day/month/year) 08 September 1998 (08.09.98)
Applicant SUONVIERI, Jukka	

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

31 March 2000 (31.03.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  F. Baechler  Telephone No.: (41-22) 338.83.38
---	---

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>48668</b>	<b>FOR FURTHER ACTION</b>		see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. <b>PCT/FI 99/ 00724</b>	International filing date (day/month/year) <b>07/09/1999</b>	(Earliest) Priority Date (day/month/year) <b>08/09/1998</b>	
Applicant  <b>NOKIA NETWORKS OY</b>			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.  
☐ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

**A METHOD AND A SYSTEM FOR DETECTING COMMUNICATION RELAYING NETWORK ELEMENTS**

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

4  
☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/FI 99/00724

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H04B7/26

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04B H04J H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 07250 A (TELIA AB ;WICKMAN JOHAN (SE)) 7 March 1996 (1996-03-07) page 5, line 19 - line 24 claim 1 ---	1, 2, 13, 14, 18-20
A	WO 96 16522 A (NOKIA TELECOMMUNICATIONS OY ;SUONVIERI JUKKA (FI)) 30 May 1996 (1996-05-30) page 1, line 1 - line 14 page 2, line 1 -page 3, line 1 -----	3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## ° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

20 December 1999

Date of mailing of the international search report

12/01/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040. Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Larcinese, A

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/FI 99/00724

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
W0 9607250	A	07-03-1996	AU 3268095 A	22-03-1996
			EP 0776551 A	04-06-1997
			SE 9402769 A	20-02-1996
			US 5910943 A	08-06-1999
<hr/>				
W0 9616522	A	30-05-1996	FI 97094 B	28-06-1996
			AU 688622 B	12-03-1998
			AU 3929795 A	17-06-1996
			CN 1138936 A	25-12-1996
			EP 0740890 A	06-11-1996
			JP 9511637 T	18-11-1997
			NO 963016 A	19-09-1996
			US 5831974 A	03-11-1998
<hr/>				

## PCT

WIPO

PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

15

Applicant's or agent's file reference <b>48668</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/FI99/00724</b>	International filing date (day/month/year) <b>07/09/1999</b>	Priority date (day/month/year) <b>08/09/1998</b>
International Patent Classification (IPC) or national classification and IPC <b>H04B7/26</b>		
Applicant <b>NOKIA NETWORKS OY et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand <b>31/03/2000</b>	Date of completion of this report <b>07.11.2000</b>
Name and mailing address of the international preliminary examining authority:  <b>European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465</b>	Authorized officer <b>Bodin, C-M</b> Telephone No. +49 89 2399 8952 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/FI99/00724

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

**Description, pages:**

1,3-8,10	as originally filed		
2,2b,9	as received on	31/08/2000	with letter of 31/08/2000

**Claims, No.:**

1-20	as originally filed
------	---------------------

**Drawings, sheets:**

1/5-5/5	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/FI99/00724

- ☐ the description,      pages:  
☐ the claims,      Nos.:  
☐ the drawings,      sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-20
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-20
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

- 2. Citations and explanations**  
**see separate sheet**



**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. The invention relates to a method for detecting network elements relaying communications between a base station and a mobile station.
2. Problem: How to detect a relaying element relaying a communication between a base station and a mobile station?

Solution: An increase in time delay is detected.

3. According to D1 (= WO-A-96/07250) a message (page 5, line 20) is added by the relaying network element to a control field regarding the time delay. Thus, no detection of an increase in time delay has to take place. Consequently, the solution according to the invention is non-obvious.

## PATENT COOPERATION TREATY

By Express Mail  
No. EL628565803US

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

To:

BERGGREN OY AB  
P.O. Box 16  
FIN-00101 Helsinki  
FINLANDE*Berggren Oy Ab*

14 -12- 1999

*mappin!*

Date of mailing (day/month/year) 06 December 1999 (06.12.99)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 48668 /ML	
International application No. PCT/FI99/00724	International filing date (day/month/year) 07 September 1999 (07.09.99)

## 1. The following indications appeared on record concerning:

☒ the applicant    ☐ the inventor    ☐ the agent    ☐ the common representative

## Name and Address

NOKIA TELECOMMUNICATIONS OY  
P.O. Box 300  
FIN-00045 Nokia Group  
Finland

## State of Nationality

FI

## State of Residence

FI

## Telephone No.

+358-9-51121

## Facsimile No.

+358-9-51127981

## Teleprinter No.

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person    ☐ the name    ☒ the address    ☐ the nationality    ☐ the residence

## Name and Address

NOKIA NETWORKS OY  
P.O. Box 300  
FIN-00045 Nokia Group  
Finland

## State of Nationality

FI

## State of Residence

FI

## Telephone No.

+358-9-51121

## Facsimile No.

+358-9-51127981

## Teleprinter No.

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

☒ the receiving Office    ☐ the designated Offices concerned  
☒ the International Searching Authority    ☐ the elected Offices concerned  
☐ the International Preliminary Examining Authority    ☐ other:
The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

## Authorized officer

*S. De Michiel*

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38

# PATENT COOPERATION TREATY

WO 00/14906  
PCT/FI99/00724

PCT

From the INTERNATIONAL BUREAU

## NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

BERGGREN OY AB  
P.O. Box 16  
FIN-00101 Helsinki  
FINLANDE

*Len. 8/4-00*

Date of mailing (day/month/year)

16 March 2000 (16.03.00)

Applicant's or agent's file reference

48668

### IMPORTANT NOTICE

International application No.

PCT/FI99/00724

International filing date (day/month/year)

07 September 1999 (07.09.99)

Priority date (day/month/year)

08 September 1998 (08.09.98)

Applicant

NOKIA NETWORKS OY et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AU,CN,EP,JP,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CR,CU,CZ,DE,DK,DM,EA,EE,ES,FI,GB,GD,GE,GH,  
GM,HR,HU,ID,IL,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,  
PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,UA,UG,UZ,VN,YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on

16 March 2000 (16.03.00) under No. WO 00/14906

### REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

### REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

J. Zahra

Telephone No. (41-22) 338.83.38

In figure 1b a floor plan identical to the floor plan in figure 1a is shown. However, in figure 1b a radio repeater 14 is placed so that the coverage area 15 of the radio repeater 14 covers the dead zone 13 of the base station 11, shown in figure 1a.

5 In figure 2 it is shown how a mobile station 21b, situated behind an obstacle 22 in a dead zone of the base station 11 communicates with the base station 11 via a radio repeater 14. When a mobile station 21b is used, the radio repeater 14 receives the communication and transmits it to the base station 11, typically using the same channel, although in some cases the use of channel changing radio repeaters are preferred. Accordingly the communication from the base station 11 is relayed via  
10 the radio repeater 14 to the mobile station 21b. Communications between the base station 11 and a second mobile station 21a that is within the coverage area of the base station are performed directly without radio repeater 14.

A basic radio repeater consists of a receiving and a transmitting section with at least two antennas, one covering the dead zone of the base station and another to carry  
15 out the communication with the base station. A typical use of radio repeaters is just to relay the received communications in a same channel, both downlink from the base stations to the mobile station and uplink from the mobile station to the base station. For economical reasons there is no sophisticated monitoring equipment usually included in the radio repeaters. Therefore in the prior art there is no way of  
20 getting any information about the operation of the radio repeaters to the network management system. This can cause situations where a radio repeater can be out of operation without the operator knowing it before receiving complaints from customers who have noticed that they have a dead zone in some area.

For the man skilled in the art an obvious solution to get more information about the  
25 function of radio repeaters would be to include sophisticated monitoring equipment in a radio repeater. This equipment could then be connected directly or through the base station to the network management system. This solution would however mean a considerable increase in the manufacturing cost of the radio repeater.

An object of the present invention is to provide a new method for detecting communication relaying network elements, like radio repeaters. The method can be  
30 utilised without any monitoring equipment in the element itself thus eliminating the above stated problems of the prior art.

propagation time delays between a base station and a mobile station. Therefore the actual way of determining the timing advance is not relevant to the present invention.

5 In fig 7a and 7b two embodiment of a system 70 according the present invention are shown. In figure 7a the system is placed in a Base Station Controller 72 and in 7b the system 70 is placed in a Base Transceiver Station 74. The system 70 has I/O-interface 76 via which the system can communicate with the Network Management system 75 and monitor communications between BTS 74 and mobile stations 21a and 21b. Communication time delays between BTS 74 and mobile stations 21a and 10 21b are monitored and different relay elements identified by the processor 71. The program 73 saved in the memory 72 is used to control processor 71 so that the relay causing network elements can be detected and possibly identified using the method according the present invention.

15 The name of a given functional entity, such as the base station controller, is often different in the context of different cellular telecommunication systems. For example, in the UMTS system the functional entity corresponding to a base station controller (BSC) is the radio network controller (RNC). Therefore, the particular terminology used to denote various functional entities in this specification are only examples according to the GSM system, and do not limit the invention in any way.

20 In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention. While a preferred embodiment of the invention has been described in detail, it should be apparent that many modifications and variations thereto are possible, all of which fall within the true spirit and scope of the invention.

# PATENT COOPERATION TREATY

By Express Mail  
No. EL628565803US

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

## PCT

### WRITTEN OPINION

(PCT Rule 66)

To:

BERGGREN OY AB  
P.O. Box 16  
00101 Helsinki  
FINLANDE

*Berggren Oy Ab*

08-08-2000

Date of mailing (day/month/year)	04.08.2000
-------------------------------------	------------

Applicant's or agent's file reference  
48668

**REPLY DUE** within 3 month(s)  
from the above date of mailing 4.11.2000

International application No.  
PCT/FI99/00724

International filing date (day/month/year)  
07/09/1999

Priority date (day/month/year)  
08/09/1998

International Patent Classification (IPC) or both national classification and IPC  
H04B7/26

Applicant

NOKIA NETWORKS OY et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain document cited
  - VII ☒ Certain defects in the international application
  - VIII ☒ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

**If no reply is filed**, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 08/01/2001.

Name and mailing address of the international preliminary examining authority:

 European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Bodin, C-M

Formalities officer (incl. extension of time limits)

Teschauer, B  
Telephone No. +49 89 2399 8231



**I. Basis of the opinion**

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

**Description, pages:**

1-10 as originally filed

**Claims, No.:**

1-20 as originally filed

**Drawings, sheets:**

1/5-5/5 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item VII**

**Certain defects in the international application**

1. Reference is made to the following document:

D1: WO-A-96/07250

2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

**Re Item VIII**

**Certain observations on the international application**

1. The vague and imprecise statement in the description on page 9, lines 20 - 24 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, PCT-Guidelines III, 4.3a). Therefore, this passage should be deleted.

However, a wording such as "It should be apparent that many modifications and variations of the invention are possible within the scope of the appended claims" is considered to comply with the PCT-Guidelines III 4.3a and Art. 6 PCT.



The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EP

By Express Mail  
No. EL628565803US

**PCT**

**CHAPTER II**

**DEMAND**

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND	
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or agent's file reference 48668	
International application No. PCT/FI99/00724	International filing date (day/month/year) 7 September 1999 (07.09.99)	(Earliest) Priority date (day/month/year) 8 September 1998 (08.09.98)	
Title of invention A METHOD AND A SYSTEM FOR DETECTING COMMUNICATION RELAYING NETWORK ELEMENTS			
<b>Box No. II APPLICANT(S)</b>			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  NOKIA NETWORKS OY P.O. Box 300 FIN-00045 Nokia Group Finland		Telephone No.:	
		Facsimile No.:	
		Teleprinter No.:	
State (that is, country) of nationality: FI		State (that is, country) of residence: FI	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)  SUONVIERI, Jukka Jenseninkatu 27 B 6 FIN-33610 Tampere Finland			
State (that is, country) of nationality: FI		State (that is, country) of residence: FI	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)			
State (that is, country) of nationality:		State (that is, country) of residence:	
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.			

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The following person is ☒ agent ☐ common representative  
 and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.  
☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.  
☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

Berggren Oy Ab  
 P.O. Box 16  
 FIN-00101 Helsinki  
 Finland

Telephone No.:

+358-9-693 701

Facsimile No.:

+358-9-693 3944

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description ☒ as originally filed  
☐ as amended under Article 34

the claims ☒ as originally filed  
☐ as amended under Article 19 (together with any accompanying statement)  
☐ as amended under Article 34

the drawings ☒ as originally filed  
☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.

☒ which is the language of a translation furnished for the purposes of international search.

☒ which is the language of publication of the international application.

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

## Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |  |   |        |
|--|---|--------|
| 1. translation of international application                              | : | sheets |
| 2. amendments under Article 34   | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19  | : | sheets |
| 5. letter  | : | sheets |
| 6. other (specify)   | : | sheets |

For International Preliminary Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

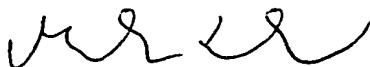
The demand is also accompanied by the item(s) marked below:

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (specify):  |

## Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Berggren Oy Ab



Markus Levlin  
Patent Agent

## For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

## For International Bureau use only

Demand received from IPEA on:

# PCT

## CHAPTER II

### FEE CALCULATION SHEET

#### Annex to the Demand for international preliminary examination

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">International application No.</td> <td>PCT/FI99/00724</td> </tr> <tr> <td>Applicant's or agent's file reference</td> <td>48668/ML/MM</td> </tr> </table>	International application No.	PCT/FI99/00724	Applicant's or agent's file reference	48668/ML/MM	<div style="border: 1px solid black; padding: 5px; height: 100px;"> <p style="text-align: center;">For International Preliminary Examining Authority use only</p> <p style="text-align: center;">Date stamp of the IPEA</p> </div>												
International application No.	PCT/FI99/00724																
Applicant's or agent's file reference	48668/ML/MM																
<p><b>Applicant</b></p> <p style="text-align: center;">NOKIA NETWORKS OY</p>																	
<p><b>Calculation of prescribed fees</b></p> <table style="width: 100%;"> <tr> <td style="width: 45%;">1. Preliminary examination fee .....</td> <td style="width: 25%; text-align: center;">EUR 1533</td> <td style="width: 10%; text-align: center;">P</td> <td style="width: 20%;"></td> </tr> <tr> <td>2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i> .....</td> <td style="text-align: center;">EUR 147</td> <td style="text-align: center;">H</td> <td></td> </tr> <tr> <td>3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....</td> <td style="text-align: center;">EUR 1680</td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">TOTAL</td> <td></td> <td></td> </tr> </table>		1. Preliminary examination fee .....	EUR 1533	P		2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i> .....	EUR 147	H		3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....	EUR 1680				TOTAL		
1. Preliminary examination fee .....	EUR 1533	P															
2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i> .....	EUR 147	H															
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....	EUR 1680																
	TOTAL																
<p><b>Mode of Payment</b></p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)</td> <td><input type="checkbox"/> cash</td> </tr> <tr> <td><input type="checkbox"/> cheque</td> <td><input type="checkbox"/> revenue stamps</td> </tr> <tr> <td><input type="checkbox"/> postal money order</td> <td><input type="checkbox"/> coupons</td> </tr> <tr> <td><input checked="" type="checkbox"/> bank draft</td> <td><input type="checkbox"/> other (specify):</td> </tr> </table>		<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash	<input type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps	<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons	<input checked="" type="checkbox"/> bank draft	<input type="checkbox"/> other (specify):								
<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash																
<input type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps																
<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons																
<input checked="" type="checkbox"/> bank draft	<input type="checkbox"/> other (specify):																
<p><b>Deposit Account Authorization</b> <i>(this mode of payment may not be available at all IPEAs)</i></p> <p>The IPEA/ _____ <input type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account.</p> <p><input type="checkbox"/> <i>(this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.</p>																	
<table style="width: 100%;"> <tr> <td style="width: 33%;">Deposit Account Number</td> <td style="width: 33%;">Date (day/month/year)</td> <td style="width: 33%;">Signature</td> </tr> </table>		Deposit Account Number	Date (day/month/year)	Signature													
Deposit Account Number	Date (day/month/year)	Signature															

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>48668</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/FI 99/ 00724</b>	International filing date (day/month/year) <b>07/09/1999</b>	(Earliest) Priority Date (day/month/year) <b>08/09/1998</b>
Applicant <b>NOKIA NETWORKS OY</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.  
☐ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

**A METHOD AND A SYSTEM FOR DETECTING COMMUNICATION RELAYING NETWORK ELEMENTS**

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

**4**

☐ None of the figures.

31 August 2000

European Patent Office

D-80298 Munich  
Germany

Via facsimile: (4 pages)  
999-49-89-2399-4465

CONFIRMATION BY MAIL!


Our Ref.: 48668/ML/MM

**REPLY TO WRITTEN OPINION**  
**INTERNATIONAL PATENT APPLICATION NO. PCT/FI99/00724**  
**APPLICANT: NOKIA NETWORKS OY**

Dear Sirs,

Replacement pages for pages 2 and 9 of the description are attached. The points raised by the examiner (re item VII and VIII) are taken care of the amendments. D1 is now mentioned in the text on page 2, and the offending phrase has been deleted from page 9.

Yours faithfully,  
**BERGGREN OY AB**

  
Markus Levlin  
Patent Attorney

**Berggren Oy Ab**

Osoite • Address:  
PL 16 • P.O. Box 16  
FIN-00101 Helsinki  
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\*European Patent Attorney  
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SWIFT MRITFIHH  
LEONIA 800017-90104  
SWIFT PSP8FIHH

Yhtiö • Company:  
krnro 80.802  
Trade Reg. No. 80.802  
LY 0107002-7  
VAT FI01070027  
Kotipaikka Helsinki

In figure 1b a floor plan identical to the floor plan in figure 1a is shown. However, in figure 1b a radio repeater 14 is placed so that the coverage area 15 of the radio repeater 14 covers the dead zone 13 of the base station 11, shown in figure 1a.

5 In figure 2 it is shown how a mobile station 21b, situated behind an obstacle 22 in a dead zone of the base station 11 communicates with the base station 11 via a radio repeater 14. When a mobile station 21b is used, the radio repeater 14 receives the communication and transmits it to the base station 11, typically using the same channel, although in some cases the use of channel changing radio repeaters are preferred. Accordingly the communication from the base station 11 is relayed via  
10 the radio repeater 14 to the mobile station 21b. Communications between the base station 11 and a second mobile station 21a that is within the coverage area of the base station are performed directly without radio repeater 14.

A basic radio repeater consists of a receiving and a transmitting section with at least two antennas, one covering the dead zone of the base station and another to carry  
15 out the communication with the base station. A typical use of radio repeaters is just to relay the received communications in a same channel, both downlink from the base stations to the mobile station and uplink from the mobile station to the base station. For economical reasons there is no sophisticated monitoring equipment usually included in the radio repeaters. Therefore in the prior art there is no way of  
20 getting any information about the operation of the radio repeaters to the network management system. This can cause situations where a radio repeater can be out of operation without the operator knowing it before receiving complaints from customers who have noticed that they have a dead zone in some area.

For the man skilled in the art an obvious solution to get more information about the  
25 function of radio repeaters would be to include sophisticated monitoring equipment in a radio repeater. This equipment could then be connected directly or through the base station to the network management system. This solution would however mean a considerable increase in the manufacturing cost of the radio repeater.

The document WO 96/07250 describes various problems and arrangements  
30 regarding repeaters. However, those arrangements do not provide solutions for the present problems.

An object of the present invention is to provide a new method for detecting communication relaying network elements, like radio repeaters. The method can be utilised without any monitoring equipment in the element itself thus eliminating the above stated problems of the prior art.



propagation time delays between a base station and a mobile station. Therefore the actual way of determining the timing advance is not relevant to the present invention.

5 In fig 7a and 7b two embodiment of a system 70 according the present invention are shown. In figure 7a the system is placed in a Base Station Controller 72 and in 7b the system 70 is placed in a Base Transceiver Station 74. The system 70 has I/O-interface 76 via which the system can communicate with the Network Management system 75 and monitor communications between BTS 74 and mobile stations 21a and 21b. Communication time delays between BTS 74 and mobile stations 21a and 10 21b are monitored and different relay elements identified by the processor 71. The program 73 saved in the memory 72 is used to control processor 71 so that the relay causing network elements can be detected and possibly identified using the method according the present invention.

15 The name of a given functional entity, such as the base station controller, is often different in the context of different cellular telecommunication systems. For example, in the UMTS system the functional entity corresponding to a base station controller (BSC) is the radio network controller (RNC). Therefore, the particular terminology used to denote various functional entities in this specification are only examples according to the GSM system, and do not limit the invention in any way.

20 In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention. While a preferred embodiment of the invention has been described in detail, it should be apparent that many modifications and variations thereto are possible.

**PCT REQUEST**

48668

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0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4 0-4-1	Form - PCT/RO/101 PCT Request Prepared using	PCT-EASY Version 2.84 (updated 01.07.1999)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	National Board of Patents and Registration (Finland) (RO/FI)
0-7	Applicant's or agent's file reference	48668
I	Title of invention	A METHOD AND A SYSTEM FOR DETECTING COMMUNICATION RELAYING NETWORK ELEMENTS AND A NETWORK ELEMENT FOR CELLULAR COMMUNICATION NETWORK
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	NOKIA TELECOMMUNICATIONS OY
II-5	Address:	P.O. Box 300 FIN-00045 Nokia Group Finland
II-6	State of nationality	FI
II-7	State of residence	FI
II-8	Telephone No.	+358-9-51121
II-9	Facsimile No.	+358-9-51127981
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	SUONVIERI, Jukka
III-1-5	Address:	Jenseninkatu 27 B 6 FIN-33610 Tampere Finland
III-1-6	State of nationality	FI
III-1-7	State of residence	FI

## PCT REQUEST

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48668

IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name	BERGGREN OY AB
IV-1-2	Address:	P.O. Box 16 FIN-00101 Helsinki Finland
IV-1-3	Telephone No.	+358-9-693 701
IV-1-4	Facsimile No.	+358-9-693 3944
IV-1-5	e-mail	email.box@berggren.elisa.fi
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AP: GH GM KE LS MW SD SL SZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT</p> <p>EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT</p> <p>EP: AT BE CH&amp;LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT</p> <p>OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT</p>
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AE AL AM AT AU AZ BA BB BG BR BY CA</p> <p>CH&amp;LI CN CR CU CZ DE DK DM EE ES FI GB</p> <p>GD GE GH GM HR HU ID IL IN IS JP KE KG</p> <p>KP KR KZ LC LK LR LS LT LU LV MD MG MK</p> <p>MN MW MX NO NZ PL PT RO RU SD SE SG SI</p> <p>SK SL TJ TM TR TT UA UG US UZ VN YU ZA</p> <p>ZW</p>

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V-5	<b>Precautionary Designation Statement</b> In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	<b>Exclusion(s) from precautionary designations</b>	NONE	
VI-1	<b>Priority claim of earlier national application</b>		
VI-1-1	Filing date	08 September 1998 (08.09.1998)	
VI-1-2	Number	981920	
VI-1-3	Country	FI	
VI-2	<b>Priority document request</b> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	<b>International Searching Authority Chosen</b>	European Patent Office (EPO) (ISA/EP)	
VIII	<b>Check list</b>	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	10	-
VIII-3	Claims	2	-
VIII-4	Abstract	1	48668.txt
VIII-5	Drawings	5	-
VIII-7	TOTAL	22	
	<b>Accompanying items</b>	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-10	Copy of general power of attorney	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	<b>Figure of the drawings which should accompany the abstract</b>	4	
VIII-19	<b>Language of filing of the international application</b>	English	
IX-1	<b>Signature of applicant or agent</b>		
IX-1-1	Name	BERGGREN OY AB	
IX-1-2	Name of signatory	Markus Levlin	
IX-1-3	Capacity	Patent Agent	

## PCT REQUEST

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48668

## FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

## FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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**PCT (ANNEX - FEE CALCULATION SHEET)**

48668

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(This sheet is not part of and does not count as a sheet of the international application)

<b>0</b>	<b>For receiving Office use only</b>	
<b>0-1</b>	International Application No.	
<b>0-2</b>	Date stamp of the receiving Office	
<b>0-4</b>	<b>Form - PCT/RO/101 (Annex)</b>	
<b>0-4-1</b>	PCT Fee Calculation Sheet Prepared using	<b>PCT-EASY Version 2.84 (updated 01.07.1999)</b>
<b>0-9</b>	Applicant's or agent's file reference	<b>48668</b>
<b>2</b>	Applicant	<b>NOKIA TELECOMMUNICATIONS OY, et al.</b>
<b>12</b>	<b>Calculation of prescribed fees</b>	
		<b>fee amount/multiplier      total amounts (FIM)</b>
<b>12-1</b>	Transmittal fee <b>T</b>	<b>⇒      800</b>
<b>12-2</b>	Search fee <b>S</b>	<b>⇒      5 618,71</b>
<b>12-3</b>	International fee Basic fee (first 30 sheets) <b>b1</b>	<b>2 400</b>
<b>12-4</b>	Remaining sheets	<b>0</b>
<b>12-5</b>	Additional amount <b>(X)</b>	<b>55</b>
<b>12-6</b>	Total additional amount <b>b2</b>	<b>0</b>
<b>12-7</b>	<b>b1 + b2 =      B</b>	<b>2 400</b>
<b>12-8</b>	Designation fees Number of designations contained in international application	<b>81</b>
<b>12-9</b>	Number of designation fees payable (maximum 10)	<b>10</b>
<b>12-10</b>	Amount of designation fee <b>(X)</b>	<b>550</b>
<b>12-11</b>	Total designation fees <b>D</b>	<b>5 500</b>
<b>12-12</b>	PCT-EASY fee reduction <b>R</b>	<b>-740</b>
<b>12-13</b>	Total International fee (B+D-R) <b>I</b>	<b>⇒      7 160</b>
<b>12-14</b>	Fee for priority document Number of priority documents requested	<b>1</b>
<b>12-15</b>	Fee per document <b>(X)</b>	<b>422</b>
<b>12-16</b>	Total priority document fee <b>P</b>	<b>⇒      422</b>
<b>12-17</b>	<b>TOTAL FEES PAYABLE (T+S+I+P)</b>	<b>⇒      14 000,71</b>
<b>12-19</b>	Mode of payment	<b>cheque</b>

**VALIDATION LOG AND REMARKS**

<b>13-2-1</b>	Validation messages Request	<b>Green?</b> <b>The title of the invention shall be short and precise. Please verify.</b>
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## PCT (ANNEX - FEE CALCULATION SHEET)

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Original (for SUBMISSION) - printed on 07.09.1999 09:53:39 AM

13-2-6	Validation messages Contents	Green? Reference number for attached copy of general power of attorney not indicated.
13-2-7	Validation messages Fees	Green? Please verify that modified fee amounts are correct.

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**PCT-EASY INFORMATION SHEET**

(For applicant use only, DO NOT submit this sheet with the international application)

**VALIDATION LOG**

	<b>Request</b>
<b>Green?</b>	The title of the invention shall be short and precise. Please verify.
	<b>Contents</b>
<b>Green?</b>	Reference number for attached copy of general power of attorney not indicated.
	<b>Fees</b>
<b>Green?</b>	Please verify that modified fee amounts are correct.

Before submitting the International Application, please carefully verify that:

- the information contained on printed Request form is correct;
- Box IX of the Request form has been signed;
- all elements of the International application as indicated in Box VIII of the Request form have been attached; and,
- the diskette containing the PCT-EASY zip file of the International Application has been enclosed and has been clearly labeled "PCT-EASY", with the applicant's or agent's file reference, and the first applicant's name.

**ATTENTION**

DO NOT modify any indications on the Request form printout. The attached PCT-EASY application has been locked. If an error or an omission is discovered at this time, you must copy the submitted application as a template and make the change or correction in a new application (using the submitted application as a template). You may create such a template by copying the submitted application from the "Stored Forms" folder to the "New PCT Forms" folder. Open the new (.OWO) file created in the "New PCT Forms" folder, correct the errors and proceed with the submission process again.